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(54) Title: POWER CABLE COMPOSITIONS FOR STRIPPABLE ADHESION

(57) Abstract: The present invention is a semiconductive power cable composition made from or containing (a) a mixture of a hightemperature polymer and a soft polymer, and (b) a conductive filler, wherein a semiconductive cable layer prepared from the composition strippably adheres to a second cable layer. The invention also includes a semiconductive cable layer prepared from the semiconductive power cable composition as well as a power cable construction prepared by applying the semiconductive cable layer over a wire or cable.

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AMENDED CLAIMS

[received by the International Bureau on 19 October 2004 (19.10.04);
original claim 1 amended, claims 2, 3 cancelled, claims 4-21 renumbered to 2-19, former claim 16 (now 14) amended]

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AMENDED CLAIMS

[received by the International Bureau on 19 October 2004 (19.10.04); original claim 1 amended, claims 2, 3 cancelled, claims 4-21 renumbered to 2-19, former claim 16 (now 14) amended]

1. A semiconductive power cable composition comprising:
   a. a mixture of a high-temperature polymer and a soft polymer; and
   b. a conductive filler,

wherein

   (i) a semiconductive cable layer prepared from the composition strippably adheres to a second cable layer,
   (ii) in the absence of a curing agent, the semiconductive cable layer having a heat resistance of less than 100% as measured by a Hot Creep test at a testing temperature of 150 degrees Centigrade,
   (iii) the high temperature polymer being a polymer suitable to impart heat resistance to the semiconductive cable layer, and
   (iv) the soft polymer being a polymer that enhances the processing characteristics of the high temperature polymer.

2. The semiconductive power cable composition of Claim 1 wherein the high-temperature polymer is selected from the group consisting of polypropylenes, polyesters, nylons, polysulfones, and polyaramides and the soft polymer is selected from the group consisting of polyethylenes, polypropylenes, polyesters, and rubbers.

3. The semiconductive power cable composition of Claim 2 wherein the high-temperature polymer is a polypropylene and the soft polymer is a polyethylene.

4. The semiconductive power cable composition of Claim 3 wherein the polyethylene is a copolymer of a polar monomer and a nonpolar monomer.

5. The semiconductive power cable composition of Claim 1 wherein the conductive filler is selected from the group consisting of carbon blacks, carbon fibers, carbon nanotubes, graphite particles, metals, and metal-coated particles.

6. The semiconductive power cable composition of Claim 1 wherein the second cable layer being chemically-crosslinked.

7. The semiconductive power cable composition of Claim 1, further comprising a curing agent.

8. The semiconductive power cable composition of Claim 1 further comprising a coupling agent.

9. The semiconductive power cable composition of Claim 8 wherein the coupling agent reduces the amount of a curing agent required to impart heat resistance to the semiconductive cable layer.

10. The semiconductive power cable composition of Claim 9 further comprising a curing agent.

11. The semiconductive power cable composition of Claim 1 wherein the mixture further comprises a compatibilizing polymer.

12. A semiconductive cable layer prepared from the semiconductive power cable composition of Claim 1.

13. A power cable construction prepared by applying the semiconductive cable layer of Claim 12 over a wire or cable.

14. A process for preparing a semiconductive power cable composition comprising the step of:

blending a mixture of a high-temperature polymer, a soft polymer, and a conductive filler,

wherein

(i) a semiconductive cable layer prepared from the composition strippably adheres to a second cable layer,

(ii) in the absence of a curing agent, the semiconductive cable layer having a heat resistance of less than 100% as measured by a Hot Creep test at a testing temperature of 150 degrees Centigrade,

(iii) the high temperature polymer being a polymer suitable to impart heat resistance to the semiconductive cable layer, and

(iv) the soft polymer being a polymer that enhances the processing characteristics of the high temperature polymer.

15. The process of Claim 14, wherein the mixture further comprises a coupling agent.

16. A process for preparing a semiconductive power cable composition comprising the steps of:

a. reactively-coupling a mixture of a high-temperature polymer, a soft polymer, and a coupling agent, in the presence of a conductive filler, wherein the coupling agent reduces the amount of a curing agent required to impart heat resistance to a semiconductive cable layer prepared from a mixture of the high-temperature polymer, the soft polymer, and the conductive filler in the absence of the coupling agent; and

b. admixing a curing agent,

wherein a semiconductive cable layer prepared from the composition strippably adheres to a second cable layer.

17. A process for preparing a power cable comprising the steps of:

a. extruding a semiconductive power cable composition comprising a mixture of a high-temperature polymer, a soft polymer, and a conductive filler, over a metallic conductor to yield a semiconductive cable layer over the metallic conductor; and

b. extruding a polymer-dielectric insulation over the semiconductive cable layer.

18. The process for preparing a power cable of Claim 17 further comprising the step of

c. extruding a second semiconductive power cable composition over the polymer-dielectric insulation to yield a second semiconductive cable layer.

19. A process for preparing a power cable comprising the steps of:

a. extruding a power cable semiconductive composition comprising a mixture of a high-temperature polymer, a soft polymer, and a conductive filler, over a metallic conductor to yield a semiconductive cable layer over the metallic conductor;

b. extruding a chemically-crosslinkable insulation composition over the semiconductive cable layer;

c. extruding a second semiconductive power cable composition over the polymer-dielectric insulation to yield a second semiconductive cable layer; and

d. crosslinking the chemically-crosslinkable insulation composition to yield a crosslinked, polymer-dielectric insulation.